

1 CLAIMS

- 2
- 3 1. A shoe for use on the end of a work string within a
- 4 well bore, the shoe comprising a generally
- 5 cylindrical body having a first end adapted for
- 6 connection to the work string and a second end
- 7 including a nose portion; the nose portion including
- 8 a rounded head distal to the body for advancement
- 9 through the well bore; the body having thereupon a
- 10 reaming portion located behind the nose portion
- 11 wherein the reaming portion comprises a plurality of
- 12 raised members, each pair of raised members being
- 13 mounted oppositely, in parallel and longitudinally
- 14 along the body, wherein each adjacent pair of members
- 15 provides a funnel for collecting approaching debris
- 16 and a channel for grinding the debris.
- 17
- 18 2. A shoe as claimed in Claim 1 wherein the reaming
- 19 members are elongate and continuous.
- 20
- 21 3. A shoe as claimed in Claim 1 or Claim 2 wherein the
- 22 reaming members are teardrop shaped.
- 23
- 24 4. A shoe as claimed in any preceding Claim wherein the
- 25 funnel comprises diverging edges of adjacent reaming
- 26 members.
- 27
- 28 5. A shoe as claimed in any preceding Claim wherein the
- 29 channel provided between each pair of members
- 30 converges from the nose portion along the reaming
- 31 portion.
- 32

- 1 6. A shoe as claimed in any preceding Claim wherein the
2 nose portion is eccentric to aid the passage of the
3 shoe through the well bore.
4
- 5 7. A shoe as claimed in any preceding Claim wherein the
6 nose portion includes one or more ports.
7
- 8 8. A shoe as claimed in any preceding Claim wherein the
9 nose portion includes a plurality of blades extending
10 from the end of the nose towards the reaming portion.
11
- 12 9. A shoe as claimed in Claim 8 wherein the blades
13 include a cutting surface to assist in breaking
14 through bridges.
15
- 16 10. A shoe as claimed in any preceding Claim wherein the
17 shoe further comprises a gauge portion located
18 furthest from the nose portion.
19
- 20 11. A shoe as claimed in Claim 10 wherein the gauge
21 portion is a stabiliser.
22
- 23 12. A shoe as claimed in Claim 10 or Claim 11 wherein the
24 gauge portion comprises a plurality of elongate
25 blades.
26
- 27 13. A shoe as claimed in Claim 12 wherein the elongate
28 blades are arranged helically along the body.
29
- 30 14. A shoe as claimed in any preceding Claim wherein the
31 shoe is constructed from a combination of relatively
32 hard and relatively soft materials.
33

- 1 15. A shoe for use on the end of a work string within a
2 well bore, the shoe comprising a generally
3 cylindrical body having a first end adapted for
4 connection to the work string and a second end
5 including a nose portion; the nose portion including
6 a rounded head distal to the body for advancement
7 through the well bore and a plurality of blades
8 extending from the head towards the body; the body
9 having thereupon a reaming portion located behind the
10 nose portion wherein the reaming portion comprises a
11 plurality of discrete raised members to ream the
12 bore.
13
- 14 16. A shoe as claimed in Claims 15 wherein the blades
15 include a cutting surface to assist in breaking
16 through bridges.
17
- 18 17. A shoe as claimed in Claim 15 or Claim 16 wherein the
19 raised members are arranged to be mounted oppositely,
20 in parallel and longitudinally along the body,
21 wherein each adjacent pair of members provides a
22 funnel for collecting approaching debris and a
23 channel for grinding the debris.
24
- 25 18. A shoe as claimed in any one of Claims 15 to 17
26 wherein the raised members are elongate and
27 continuous.
28
- 29 19. A shoe as claimed in any one of Claims 15 to 18
30 wherein the reaming members are teardrop shaped.
31

- 1 20. A shoe as claimed in any one of Claims 17 to 18
2 wherein the funnel comprises diverging edges of
3 adjacent reaming members.
4
- 5 21. A shoe as claimed in any one of Claims 17 to 20
6 wherein the channel provided between each pair of
7 members converges from the nose portion along the
8 reaming portion.
9
- 10 22. A shoe as claimed in any one of Claims 15 to 21
11 wherein the nose portion includes one or more ports.
12
- 13 23. A shoe as claimed in any one of Claims 15 to 22
14 wherein the shoe further comprises a gauge portion
15 located furthest from the nose portion.
16
- 17 24. A shoe as claimed in Claim 23 wherein the gauge
18 portion is a stabiliser.
19
- 20 25. A shoe as claimed in Claim 23 or Claim 24 wherein the
21 gauge portion comprises a plurality of elongate
22 blades.
23
- 24 26. A shoe as claimed in Claim 25 wherein the elongate
25 blades are arranged helically along the body.
26
- 27 27. A shoe as claimed in any one of Claims 15 to 26
28 wherein the shoe is constructed from a combination of
29 relatively hard and relatively soft materials.